Roll-Pitch Bearing. The bearing error will peak in each of the four quadrants around own ship for targets on relative bearings of 045°, 135°, 225° and 315° and will be zero at relative bearings of 0°, 90°, 180° and 270°. This error has a sinusoidal variation at twice the roll frequency. For a 10° roll the mean error is 0.22° with a 0.22° peak sine wave superimposed.

Beam shape—assumed normal distribution giving bearing error with o = 0.05.

Pulse shape— assumed normal distribution giving range error with o = 20 meters.

Antenna backlash—assumed rectangular distribution giving bearing error ±0.5 maximum.

Quantization

Bearing—rectangular distribution ±0.01° maximum.

Range—rectangular distribution ±0.01 n.m. maximum.

Bearing encoder assumed to be running from a remote synchro giving bearing errors with a normal distribution o = 0.03°

Gyro compass

Calibration error 0.5°.

Normal distribution about this with o = 0.12°.

Log

Calibration error 0.5 kt.

Normal distribution about this, 3 o = 0.2 kt.

APPENDIX B TO §164.38—U.S. MARITIME ADMINISTRATION COLLISION AVOIDANCE SYSTEM SPECIFICATION

A collision system designed as a supplement to both surface search navigational radars via interswitching shall be installed. The system shall provide unattended monitoring of all radar echoes and automatic audio and visual alarm signals that will alert the watch officer of a possible threat. The display shall be contained within a console capable of being installed adjacent to the radar displays in the wheelhouse and may form a part of the bridge console.

Provision for signal input from the ship's radars, gyro compass, and speed log, without modification to these equipments shall be made. The collision avoidance system, whether operating normally or having failed, must not introduce any spurious signals or otherwise degrade the performance of the radars, the gyro compass or the speed log.

Computer generated display data for each acquired target shall be in the form of a line or vector indicating true or relative target course, speed and both present and extrapolated future positions. Data shall be automatically displayed on a cathode ray tube or other suitable display contrivance sufficiently bright and unobstructed to permit viewing by more than one person at a time.

In addition to displaying the collision potential of the most threatening fixed and moving targets, the system shall be capable of simultaneously showing land masses.

The system display shall include a heading indication and bearing ring. The system shall also have the capability of allowing the operator to select ''head-up'' and to cancel the vector or line presentation of any of the targets. The presentation shall be nonsmearing when changing modes or display scales in order to permit rapid evaluation of the displayed data.

Target acquisition, for display data purposes, may be manual, automatic or both, as specified by Owner.

For any manual acquisition system the alarms shall be initiated by a preset minimum range; and likewise for any automatic acquisition system the alarms shall be initiated by a preset minimum acceptable passing distance (CPA—Closest Point of Approach) and a preset advance warning time (TCPA—Time to Closest Point of Approach). Means shall be provided to silence the audio alarm for a given threat but the alarm shall resound upon a subsequent threat. The visual alarm shall continue to operate until all threats have been eliminated. If the collision avoidance system fails to perform as indicated above, after the system is set for unattended monitoring, the system shall produce both audio and visual warning alarms.

The system shall be capable of simulating a trial maneuver.

In addition to the target display, an alphanumeric readout shall be provided which can present range, bearing, course, speed, CPA and TCPA for any selected target, either on the target display or by other display means.

The collision avoidance system shall be energized from the interior communications panel board in the wheelhouse.

The collision avoidance function may be incorporated in an integrated conning system, provided that failure of any other integrated system component will not degrade the collision avoidance function.

[CGD 79–148, 45 FR 54039, Aug. 14, 1980; 45 FR 71800, Oct. 30, 1980, as amended by CGD 83–004, 49 FR 43467, Oct. 29, 1984; USCG–1998–3799, 63 FR 35532, June 30, 1998; USCG–2011–0257, 76 FR 31838, June 2, 2011]

§164.39 Steering gear: Foreign tankers.

(a) This section applies to each foreign tanker of 10,000 gross tons or more, except a public vessel, that—

(1) Transfers oil at a port or place subject to the jurisdiction of the United States; or

(2) Otherwise enters or operates in the navigable waters of the United States, except a vessel described by §164.02 of this part.

(b) *Definitions.* The terms used in this section are as follows:

Constructed means the same as in Chapter II–1, Regulations 1.1.2 and 1.1.3.1, of SOLAS 74.

Existing tanker means a tanker—

(1) For which the building contract is placed on or after June 1, 1979;

(2) In the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after January 1, 1980;

(3) The delivery of which occurs on or after June 1, 1982; or

(4) That has undergone a major conversion contracted for on or after June 1, 1979; or construction of which was begun on or after January 1, 1980, or completed on or after June 1, 1982.

Public vessel, *oil*, *hazardous materials*, and *foreign vessel* mean the same as in 46 U.S.C. 2101.

SOLAS 74 means the International Convention for the Safety of Life at Sea, 1974, as amended.

Tanker means a self-propelled vessel defined as a tanker by 46 U.S.C. 2101(38) or as a tank vessel by 46 U.S.C. 2101(39).

(c) Each tanker constructed on or after September 1, 1984, must meet the applicable requirements of Chapter II–1, Regulations 29 and 30, of SOLAS 74.

(d) Each tanker constructed before September 1, 1984, must meet the requirements of Chapter II–1, Regulation 29.19, of SOLAS 74.

(e) Each tanker of 40,000 gross tons or more, constructed before September 1, 1984, that does not meet the single-failure criterion of Chapter II–1, Regulation 29.16, of SOLAS 74, must meet the requirements of Chapter II–1, Regulation 29.20, of SOLAS 74.

(f) Each tanker constructed before September 1, 1984, must meet the applicable requirements of Chapter II–1, Regulations 29.14 and 29.15, of SOLAS 74.

[CGD 83–043, 60 FR 24771, May 10, 1995]

§164.40 Devices to indicate speed and distance.

(a) Each vessel required to be fitted with an Automatic Radar Plotting Aid (ARPA) under §164.38 of this part must be fitted with a device to indicate speed and distance of the vessel either through the water or over the ground.

(b) The device must meet the following specifications:

(1) The display must be easily readable on the bridge by day or night.

(2) Errors in the indicated speed, when the vessel is operating free from shallow water effect, and from the effects of wind, current, and tide, should not exceed 5 percent of the speed of the vessel, or 0.5 knot, whichever is greater.

(3) Errors in the indicated distance run, when the vessel is operating free from shallow water effect, and from the effects of wind, current, and tide, should not exceed 5 percent of the distance run of the vessel in one hour or 0.5 nautical mile in each hour, whichever is greater.

[CGD 83–004, 49 FR 43467, Oct. 29, 1984, as amended by USCG–1998–3799, 63 FR 35532, June 30, 1998]

§164.41 Electronic position fixing devices.

(a) Each vessel calling at a port in the continental United States, including Alaska south of Cape Prince of Wales, except each vessel owned or bareboat chartered and operated by the United States, or by a state or its political subdivision, or by a foreign nation, and not engaged in commerce, must have a satellite navigation receiver with—

(1) Automatic acquisition of satellite signals after initial operator settings have been entered; and

(2) Position updates derived from satellite information during each usable satellite pass.

(b) A system that is found by the Commandant to meet the intent of the statements of availability, coverage, and accuracy for the U.S. Coastal Confluence Zone (CCZ) contained in the U.S. ''Federal Radionavigation Plan'' (Report No. DOD–NO 4650.4–P, I or No. DOT–TSC–RSPA–80–16, I). A person desiring a finding by the Commandant under this subparagraph must submit a written application describing the device to the Commandant (CG–DCO–D), Attn: Deputy for Operations Policy and Capabilities, U.S. Coast Guard Stop